151-WP-002-001

Plan for Physical Configuration Audits of EOSDIS Core System, ECS Version 2 Commercial Off-the-Shelf Hardware

White Paper

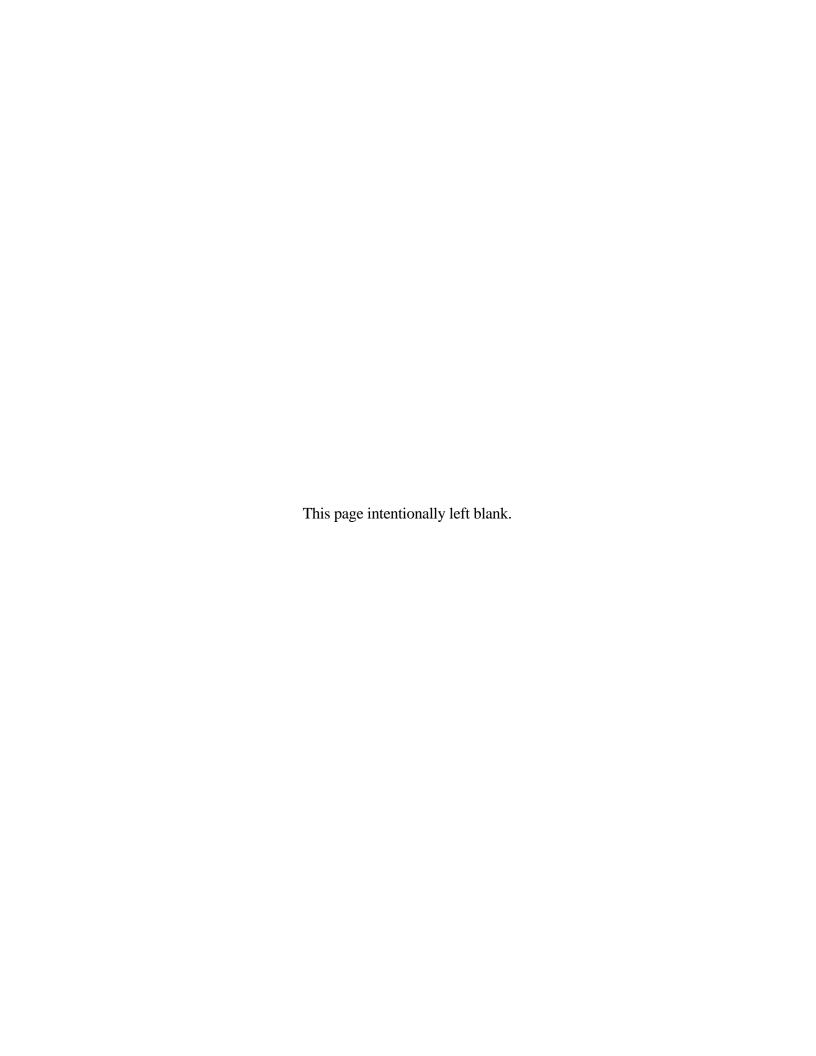White Paper--Not intended for formal review or government approval.

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Abstract

This plan sets forth the procedures by which the ECS Version 2 hardware configurations will be formally audited and conveyed to ECS site personnel.

The physical audit will examine the "as built" hardware configuration of each ECS Version 2 site to assure it conforms to product baseline specifications.

Audits will be conducted by an ECS/Government team. The team will certify whether the configuration audited conforms to the Product Baseline (PBL).

Audits will take place at the GSFC, NSIDC, EDC, LaRC, and SMC

Keywords: Audit, ECS Version 2, EDC, EIN, GSFC, LaRC, NSIDC, PBL, PCA, SMC, and VCATS.

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1. Introduction

1.1   Purpose of Plan

This plan sets forth the procedures by which the Earth Observation System Core System (ECS) Version 2 hardware[1] configurations will be formally audited and conveyed to ECS site personnel

1.2   Objectives of Audits

Examine the "as built" configuration of ECS Version 2 hardware to assure it conforms to product baseline specifications. This will be accomplished by conducting a Physical Configuration Audit (PCA) at each site.

Report all discrepancies found during each audit. This will be performed using the ECS software Nonconformance Reporting and Corrective Action (NRCA) system.

Convey ECS Version 2 configurations to resident ECS personnel for maintenance and operations. This will be accomplished by a certification process that assures that the configuration audited conforms to the Product Baseline.

1.3   Scope of Audits

Audits will examine all ECS Version 2 hardware to assure it conforms to the product baseline established for the Release. The audits will be conducted by an ECS audit team composed of representatives of all ECS organizations and government personnel.

Audits will be conducted in accordance with the ECS Project Instruction CM-1-009, Configuration Audits.

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[1]   This document addresses only hardware audits. Software (both COTS and Custom) audits will be covered in a separate plan, that will be prepared when the schedule for these audits is available.

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2. Documentation

2.1 Parent Document

GSFC 423-41-01, Goddard Space Flight Center, ESDIS Core System Statement of Work

2.2 Applicable Documents

102-CD-001-004, Development Configuration Management Plan for the ECS Project

102-CD-002-001, Maintenance and Operations Configuration Management Plan

194-602-OP1-001, Property Management Plan for the ECS Project

Commercial Off-the-Shelf (COTS) Hardware Product Baseline Technical Paper for the ECS Project:

   (1) Floor Plans:

      GSFC Version 2.0 Floor Plan 151-TD-006-001

      EDC Version 2.0 Floor Plan   151-TD-012-001

      NSIDC Version 2.0 Floor Plan   151-TD-018-001

      LaRC Version 2.0 Floor Plan 151-TD-024-001

      SMC Version 2.0 Floor Plan   151-TD-030-001

   (2) Hardware Diagrams (Design):

      GSFC Version 2.0 Hardware Diagram (Design)   151-TD-007-001

      EDC Version 2.0 Hardware Diagram (Design)   151-TD-013-001

      NSIDC Version 2.0 Hardware Diagram (Design)   151-TD-019-001

      LaRC Version 2.0 Hardware Diagram (Design)   151-TD-025-001

      SMC Version 2.0 Hardware Diagram (Design)   151-TD-031-001

   (3) Hardware/Network Diagrams:

      GSFC Version 2.0 Hardware/Network Diagram   151-TD-008-001

      EDC Version 2.0 Hardware/Network Diagram   151-TD-014-001

      NSIDC Version 2.0 Hardware/Network Diagram   151-TD-020-001

      LaRC Version 2.0 Hardware/Network Diagram   151-TD-026-001

      SMC Version 2.0 Hardware/Network Diagram   151-TD-032-001

(4) Cable Management Plans:

GSFC Version 2.0 Cable Management Plan   151-TD-009-001

EDC Version 2.0 Cable Management Plan   151-TD-015-001

NSIDC Version 2.0 Cable Management Plan 151-TD-021-001

LaRC Version 2.0 Cable Management Plan   151-TD-027-001

SMC Version 2.0 Cable Management Plan   151-TD-033-001

(5) Vendor Cost and Tracking System (VCATS) EDS Identification Number (EIN) to Host Name Mapping.

GSFC VCATS EIN/Host Name Mapping   151-TD-010-001

EDC VCATS EIN/Host Name Mapping   151-TD-016-001

NSIDC VCATS EIN/Host Name Mapping   151-TD-022-001

LaRC VCATS EIN/Host Name Mapping   151-TD-028-001

SMC VCATS EIN/Host Name Mapping   151-TD-034-001

(6) Listing of COTS vendor documentation:

GSFC Vendor Documentation List   151-TD-011-001

EDC Vendor Documentation List   151-TD-017-001

NSIDC Vendor Documentation List   151-TD-023-001

LaRC Vendor Documentation List   151-TD-029-001

SMC Vendor Documentation List   151-TD-035-001

2.3   Reference Documents

a.   Baseline Manager (i.e., XRP-II) reports

b.   Design specification(s) (e.g., DID 305, Segment/Design Specifications)[2]:

(1) 305-CD-030-002, Release-B GSFC DAAC Design Specification

(2) 305-CD-031-002, Release B Langley DAAC Design Specification

(3) 305-CD-033-002, Release-B EDC DAAC Design Specification

(4) 305-CD-035-002, Release-B NSIDC DAAC Design Specification

(5) 305-CD-038-002, Release-B System Monitoring and Coordination Center Design Specification

2.4   Information Documents

MIL STD 973, Configuration Management

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[2]   Final documentation is not required until RRR+30 days.

3. Audit Process

3.1 Concept

Audits of ECS Version 2 will be conducted on phased basis.

(a) <u>Planning</u>. Audit will be initiated by a meeting between CMO and the Deployment Manager. Based upon agreements reached at this meeting the contents of the Product Baseline (PBL) will be defined, a detailed plan will be developed, and the audit team formed. The audit team will meet, complete the plan, review it for completeness, and present the final plan to the Deployment Manager for submission to the ECS CCB.

(b) <u>Definition of the Product Baseline</u>. PBL will include the hardware documents listed at paragraph 2.2 that apply to specific DAACs. Viewed collectively these documents will define the Technical Data Package (TDP) for the respective DAACs. In addition the audit team will use audit the Baseline Manager reports (reference documents) for completeness and to determine their utility for future audits.

(c) <u>Development of TDP Documentation</u>. TDP for each site will be completed prior to the start of pre-audit analysis, approximately seven-ten working days before the actual PCA is conducted. Prior to beginning of the audits all applicable documentation will be reviewed by each member of the audit team for consistency and completeness to the ECS Version 2 product baseline prior to release to the government for review. Audit team will review this data for shortages and unincorporated design changes. In addition the team will review TDP for deviations and waivers.

(d) <u>Training</u> of Audit Team will be conducted in the week prior to each audit. This training will include audit methodology, process for "redlining" documents, and NCR preparation.

(e) <u>PCA</u>. Phased basis:

> (1) Analysis and coordination with site. This will be accomplished in the week prior to each audit. Prior to this time the TDP will be posted on the ECS web site so that each member of the audit team can review it for completeness and correction. During this week CMO will coordinate the audit with each site and provide them advance information on site requirements.

> (2) Preliminary audit by site personnel. While not a requirement, it is anticipated that ECS personnel, using information available on the web page, will conduct a preliminary audit of the site COTS hardware configuration.

> (3) Site visit by Audit Team. This audit will confirm that the as delivered COTS hardware at each site is properly reflected in product baseline documentation. PCA will utilize the documentation identified at para 2.2. During this audit equipment location and position

name will be correlated with information shown on the floorplan and VCATS documentation to assure completeness of configuration at the EOC. Audit will also confirm that each site is configured in accordance with its network diagram and cable management plan.

Discrepancies noted during this review will be recorded as Non-Conformance Reports (NCR) and entered into the ECS software NRCA system.

Upon completion of site visit, the audit team will complete audit certification as required by the Project Instructions. Certificate to be used is at Appendix A.

(4) Reconciliation. Upon completion of all audits the audit team will compile results and provide input into final report of site PCAs. This report will summarize the audits, to include results of the certification process, and define the product baseline established by the audits.

(5) Maintenance. Per Property Management Plan.

3.2   Schematic

3.2.1 Audit Process

The overall process can be shown schematically as seen below:
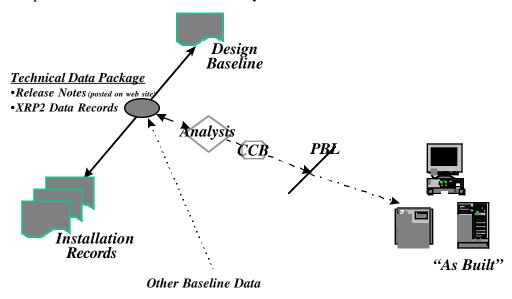

Figure 3-1. Relation of documentation used for Configuration Audits

3.2.2 Explanation of Schematic

(a) Analysis. After completing the TDP the audit team will analyze the package. Concurrently the TDP will be made available to site personnel for review.

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(b) Identification of differences. If found these will be documented and presented to the appropriate CCB with recommendations as to corrective action necessary.

(c) Once the above actions are completed the TDP will become the proposed Product Baseline (PBL) as used as audit documentation.

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4. Responsibilities

4.1   ECS Offices:

4.1.1   Deployment Manager

(a) Provides guidance to audit team in preparation of plan

(b) Appoints principal point of contact for audits to Participate in audits and resulting turnover process.

(c) Reviews plan; submits to CCB.

(d) Assures government representation on audit team.

(e) Maintain cognizance of audit; supports activities to the extent required.

(f) Assures appropriate level of resources are assigned to audit by ECS organizations.

(g) Monitors progress.

4.1.2   Configuration Management Office (CMO)

(a) Provides audit coordinator to develop audit plan and schedule.

(b) Oversees development of TDP in accordance with audit plan.

(c) Trains the audit team.

(d) Provides status accounting for the audit team.

(e) Prepares final report of ECS Version 2 audits.

4.1.3   Maintenance and Operations Office (M&O)

(a) Provides team leader, configuration status accounting personnel, and support personnel as required for each audit.

(b) Manages and conducts audits, to include resulting turnover process.

(c) Creates NCRs, as necessary.

(d) Coordinates resolution of NCR generated during audit.

(e) Completes portion of TDP in accordance with audit plan.

(f) Manages corrections to TDP.

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4.1.4 System Engineering Office (SEO)

(a) Completes portion of TDP in accordance with audit plan.

(b) Corrects TDP documentation as required.

4.1.5 Science and Communications Development Office (SCDO)

(a) Assign representative(s) to audit team

(b) Provide cognizant engineers to support resolution of NCR generated during audit.

(c) Supports development of TDP in accordance with audit plan.

(d) Corrects TDP documentation, as required.

4.1.6 Quality Office:

(a) Assign representative(s) to audit team.

(b) Provide cognizant engineers to support resolution of NCR generated during audit.

(c) Monitor process throughout.

4.1.7 Audit Team:

(a) Reviews TDP.

(b) Conduct audits.

(c) Creates NCRs, supports resolution during conduct of audits.

(d) Prepares minutes of all audit meeting(s); maintains list of actions to be accomplished.

(e) Certifies completeness of all audits.

4.2 Coordinating Instructions

Activity will be coordinated by project CM, which will form the audit team and provide necessary training to audit team.
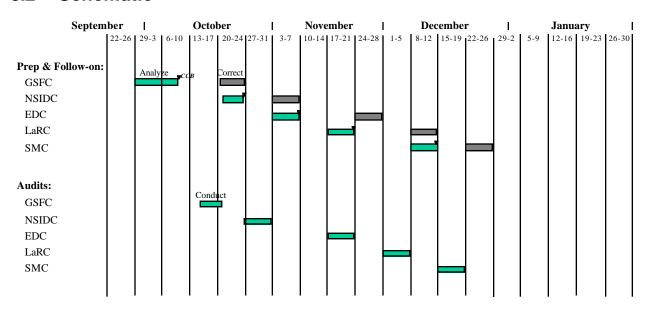
Coordination of all administrative procedures and conduct of the audits will be accomplished by M&O.

5. Schedule

5.1 Audit Dates

Site	Analysis	Conduct	Reconciliation
GSFC	9/29/97 - 10/10/97	10/15/97 - 10/20/97	10/20/97 - as required
NSIDC	10/21/97 - 10/24/97	10/27/97 - 10/31/97	11/3/97 - as required
EDC	11/3/97 - 11/7/97	11/17/97 - 11/21/97	11/21/97 - as required
LaRC	11/21/97 - 11/26/97	12/1/97 - 12/5/97	12/8/97 - as required
SMC	12/8/97 - 12/12/97	12/15/97 - 12/19/97	12/22/97 - as required

5.2 Schematic

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Appendix A. Certificate

PCA   Certificate

The Physical Configuration Audit of Version 2 COTS Hardware (as described in ECS Documents #151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, and 151-TD-0nn-001) was concluded on _____ at _____.

This audit examined the "as built" configuration to assure that the "as built" COTS hardware installed at _____ conforms to the Product Baseline (specified in ECS Document # 151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, 151-TD-0nn-001, and 151-TD-0nn-001) established for _____.

As a result of the audit I certify that the COTS Hardware:

☐ Conforms to the product baseline and is acceptable for turnover.

☐ Conforms to the product baseline upon resolution of the following specified problems:

_____

_____

and will be acceptable to turnover upon resolution of the above.

☐ Does not conform to the product baseline.

_____
(Name)   (Organization)   (Date)

Figure A-1. PCA Certificate

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Abbreviations and Acronyms

CCB	Configuration Change Board
CCR	Configuration Change Request
COTS	Commercial Off-the-Shelf
CSR	Consent to Ship Review
DAAC	Distributed Active Archive Center
DD250	Department of Defense Form Nr 250
DDTS	Distributed Defect Tracking Software
DID	Data Item Description
ECS	EOSDIS Core System
EOC	ECS Operations Center
EOSDIS	Earth Observing System Data and Information System
ESDIS	Earth Science Data and Information System
FCA	Functional Configuration Audit
FOS	Flight operations Segment
GSFC	Goddard Space Flight Center (DAAC)
I&T	Integration and Test
M&O	Maintenance and Operations
MIL STD	Military Standard
NCR	Nonconformance Report
NCRA	Nonconformance Reporting and Corrective Action system
PCA	Physical Configuration Audit
PI	Project Instruction
QA	Quality Assurance
RRR	Release Readiness Review
RTM	Requirements and Traceability Management
SCDO	Science and Communications Development Office

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SMO	System management Organization
SSI&T	Science Software Integration and Test
TDP	Technical Data Package
VCATS	Vendor Costs and Tracking System
VDD	Version Description Document